

applied to other industries and lines of business. The radical departure in spots from the dignified language of the average text is in rather strange contrast to other parts of the book which are nothing more than lists of short statements regarding processes or equipment. The book is better suited, although by no means entirely so, to British than American readers because of the more frequent reference to British books, industries, etc.

It covers an amazing amount of ground by the simple expedient of mentioning one thing after the other much as a dictionary does, but without the dictionary's detail.

It is very doubtful whether the average student or teacher would derive much benefit from the book unless he has had some work experience. It is through that that the importance of the little things become noticeable. Every work manager knows that nearly all plant troubles are little ones when they start but a lot of little ones can make a big wreck. Here then lies the chief value of the book—a collection of little trouble makers hardly ever mentioned in textbooks and certainly not between the covers of any one book. It describes the facts that the average man learns only by experience.

As a book for supplementary reading for chemistry students there is a place for the work, especially if taken in connection with actual factory work.

CARL HANER

#### Beginning Chemistry and Its Uses.

FREDERICK C. IRWIN, Head of the Department of Chemistry, The College of the City of Detroit, Detroit, Michigan, BYRON J. RIVETT, Principal of the Northwestern High School, Detroit, Michigan, ORRETT TATLOCK, Assistant Professor of Chemistry, The College of the City of Detroit, Detroit, Michigan. First edition. Row, Peterson & Co., Evanston, Illinois, 1927. vii + 607 pp. 106 figures, 29 portraits. 13.5 × 19 cm. \$1.60.

A first-year textbook in chemistry with

the usual content and arrangement of subject-matter. The aims of the authors are to emphasize practical applications rather than technical theories, develop early topics gradually and clearly for the average pupil and to explain necessary technical terms when they are first used. Definitions of terms are set in bold-faced type with much space to give special emphasis. The chapters are closed with summaries and question exercises.

The weak point of most textbooks is the mere giving of information and the failure to develop constructive thinking. What the pupil does with the information is the important thing. The questions at the close of the chapters are so necessary to compel practical thinking that we could wish for more questions of this excellent type. "How can you prove that water is a compound?" Others such as, "What is a substance? What is an element?" however, only call for a repetition of the definition previously encountered. All such questions should be thoroughly tested by use before publication. In the question, "Why is calcium chloride used when generating hydrogen?" we wonder if the pupil will consider the chloride to be necessary. The reviewer had to search the text to find the answer to "Is the stability of water as a compound a matter of consequence to chemists?" These possible answers were located: "It (water) is also important because it may readily be decomposed into two elements. . . ." (p. 56). "Water is a very stable compound; that is, it does not readily or easily separate into its constituent parts. It stoutly resists decomposition" (p. 67).

A doubtful innovation is presented by briefly defining allotropy in connection with ozone, a rather unfamiliar substance, and giving only passing mention of it in connection with the more familiar elements, sulfur and carbon. Predicting the future trend of industrial chemistry is becoming more hazardous in these transitory days of rapid development. "As

water power is further developed in the United States, it is likely that the process (Birkeland-Eyde) will come into general use here." The last copy of *Industrial and Engineering Chemistry* tells us that the above process is to be replaced on its native heath by the Haber-Bosch process.

To a discussion of the structure of the atom and the theory of electrons the book devotes three pages. It can be used or disregarded as the instructor may desire for, quite in contrast to some recent books, the treatment is isolated and not woven integrally into the subject of valence and the periodic system.

The type is ten point which adds much to the very desirable quality of legibility as compared with the usual twelve-point type. Variations in the type faces are noticeable and damaged type shows on page one. Perspective instead of line drawings are used for the etched figures, with good contrast and originality. The other illustrations in electrotpe were not cleaned frequently in the printing to prevent the too common muddy effects. The binding is excellent and the cover attractive. In many respects the work is very marked in its superiority to the earlier text by the same authors.

H. R. SMITH

**Qualitative Analysis.** W. F. F. SHEAR-CROFT. Oxford University Press, New York City, 1927. xvi + 71 pp. 16.5 X 11.5 cm. 35 cents.

The text proper has twenty pages devoted to theoretical discussions, and thirty-one pages devoted to the treatment of analytical methods. The book is bound in flexible cloth covers, carries no illustrations, and is printed in clear type on heavy paper. Very few typographical errors were observed, but one notes the occasional differences in spelling such words as "radical" and "shows" (radicle and shews) which may be expected in an English publication.

This rather unusual text is offered for use in preparatory schools. Part I, twenty pages, deals with such elementary

ideas as: Atoms, Molecules, Salts, Acids, Bases. Then follows a discussion of Ions with a consideration of equation writing and the conditions under which precipitation occurs.

The practical part, Part II, begins with a consideration of methods of testing an unknown in the dry way; effects of heat, flame tests, borax bead tests, followed by the action of acids upon the substance under examination. Explanatory notes accompany. Then follow the successive schemes of analysis for the usual groups, the scheme for each being arranged in the genealogical table form which the author states has been proved the most readily comprehensible by beginning students. Copious notes are given with each group. One notes the absence of any treatment of an unknown when phosphates are present. Acid analysis is practically limited to the detection of the sulfate, nitrate, and chloride ions.

A record of an actual analysis covering four pages is given in detail showing how the various basic and acid ions are detected.

The author has taken considerable pains to impress upon the student the importance of avoiding the purely mechanical method of procedure and has stressed the value of questioning every step and reasoning every process, a method to be commended.

With the exception noted above, the little pocket manual covers, in an elementary way, the chief methods for simple analyses of unknowns. Teachers who believe that qualitative analysis, or some portion of it, should find place in the usual preparatory school course in chemistry and who can find time for such work may be interested in the small text. It does not seem sufficiently comprehensive to serve as a manual for the more extended study of the methods of basic and acid analysis in a longer course.

C. H. STONE

**Tentative Course of Study in Elementary Science.** GERALD S. CRAIG, Teachers